ABSTRACT

Background: Hemidiaphragmatic paresis after ultrasound-guided interscalene brachial plexus block is reported to occur in up to 100% of patients. We tested the hypothesis that an injection lateral to the brachial plexus sheath reduces the incidence of hemidiaphragmatic paresis compared with a conventional intrafascial injection, while providing similar analgesia.

Methods: Forty ASA I-II patients undergoing elective shoulder and clavicle surgery under general anaesthesia were randomized to receive an ultrasound-guided interscalene brachial plexus block for analgesia, using 20ml bupivacaine 0.5% with epinephrine 1:200000 injected either between C5 and C6 within the interscalene groove (conventional intrafascial injection),or 4 mm lateral to the brachial plexus sheath (extrafascial injection). The primary outcome was incidence of hemidiaphragmatic paresis (diaphragmatic excursion reduction >75%), measured by M-mode ultrasonography, before and 30 min after the procedure. Secondary outcomes were forced vital capacity, forced expiratory volume in 1s, and peak expiratory flow before and 30 min after the procedure. Block related outcomes were onset of sensory and motor block and post op duration of analgesia

Results: The incidences of hemidiaphragmatic paresis were 95% (95% CI: 68–99%) and 25% (95% CI: 6–46%) in the conventional and extrafascial injection groups, respectively ($P<0.0001$). Other respiratory outcomes were significantly better preserved in the extrafascial injection group. A conventional injection was associated with a faster onset and longer duration of post op analgesia

Conclusions: Ultrasound-guided interscalene brachial plexus block with an extrafascial injection reduces the incidence of hemidiaphragmatic paresis and impact on respiratory function while providing similar analgesia compared to a conventional injection.

Key words: analgesia; anesthesia, regional; brachial plexus block; diaphragm; postoperative pain